

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim underlining shows the changes from the originally issued patent.

1 1-26. (Cancelled)

1 27. (Thrice Amended) A method of parallelizing an operation, the method comprising the
2 steps of:
3 dividing the operation into a set of work partitions;
4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions;
7 wherein the step of assigning work partitions is performed by assigning the work
8 partitions in a sequence based at least in part on sizes associated with the work
9 partitions;
10 said plurality of entities operating in parallel on work partitions assigned to them to
11 perform said operation; and
12 wherein assigning the work partitions in a sequence includes assigning a first previously
13 unassigned work partition to a particular entity of the plurality of entities, and
14 when the particular entity completes processing the first work partition, picking a
15 second previously unassigned work partition based at least in part to the size of
16 the second work partition, and assigning the second unassigned work partition to
17 the particular entity for processing.

1 28. (Once Amended) The method of Claim 27 wherein the step of assigning the work
2 partitions in a sequence is performed by assigning relatively larger work partitions before
3 assigning relatively smaller work partitions.

1 29. (Thrice Amended) A method of parallelizing an operation, the method comprising the
2 steps of:
3 dividing the operation into a set of work partitions;
4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions, wherein the step of assigning
7 work partitions includes;
8 assigning said at least one entity a first work partition from said set of work
9 partitions; and
10 after said at least one entity has completed operation on said first work partition,
11 assigning said at least one entity a second work partition from said set of work
12 partitions, wherein the step of assigning said at least one entity a second work
13 partition includes
14 determining whether there are any unassigned work partitions from a first level in
15 a hierarchy to which said first work partition belonged; and
16 if there are no unassigned work partitions from the first level in the
17 hierarchy, then selecting said second work partition from a level in
18 said hierarchy that is two levels above said first level in said
19 hierarchy;
20 said plurality of entities operating in parallel on work partitions assigned to them to
21 perform said operation; and
22 wherein the operation is specified in a query that corresponds to the hierarchy of
23 operations.

1 30. (Once Amended) A method of parallelizing an operation, the method comprising the
2 steps of:
3 dividing the operation into a set of work partitions;
4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions;

7 said plurality of entities operating in parallel on work partitions assigned to them to
8 perform said operation;
9 the method includes the step of generating a serial execution plan for operations in a
10 database management system (DBMS) running on a computer system;
11 the method includes the step of generating a parallelized execution plan for said serial
12 execution plan, said parallelized execution plan including first and second
13 operations;
14 the step of dividing an operation is performed by dividing said second operation;
15 the plurality of entities includes one or more slave processes operating on a plurality of
16 data partitions, the quantity of said data partitions being greater than the quantity
17 of said slave processes;
18 executing said parallelized execution plan when a plurality of parallel resources of said
19 computer system are available; and
20 executing said serial execution plan when said plurality of resources are not available.

1 31. (Once Amended) The method of claim 30 wherein said step of generating a parallelized
2 execution plan includes the steps of;

3 identifying one or more segments of said serial execution plan that can be parallelized;

4 and

5 identifying partitioning requirements of said one or more segments.

1 32. (Once Amended) The method of claim 30 wherein said step of generating a parallelized
2 execution plan is based on a specification of parallelism in a statement specifying one of
3 said operations.

1 33. (Once Amended) A method of parallelizing an operation, the method comprising the
2 steps of;

3 dividing the operation into a set of work partitions;

4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions;
7 said plurality of entities operating in parallel on work partitions assigned to them to
8 perform said operation;
9 generating an execution plan for said operation;
10 examining said execution plan from bottom up;
11 identifying a parallelized portion of said execution plan, said parallelized portion can be
12 processed in parallel, said parallelized portion including first and second
13 operations, said first and second operations being executable in parallel;
14 wherein the step of dividing the operation is performed by dividing said second operation;
15 wherein the plurality of entities includes one or more slave processes operating on a
16 plurality of data partitions, the quantity of said data partitions being greater than
17 the quantity of said slave processes;
18 identifying some serial portion of said execution plan, said serial portion can be processed
19 in serial; and
20 allocating a central scheduler between said parallelized portion and said serial portion.

1 34. (Once Amended) The method of Claim 33 further including the steps of:
2 identifying a first data flow requirement for a first portion of said execution plan said first
3 data flow requirement corresponding to a partitioning of a data flow required by
4 said first portion;
5 identifying a second data flow requirement for a second portion of said execution plan
6 said second data flow requirement corresponding by said second portion; and
7 allocating a data flow director between said first portion and said second portion when
8 said first data flow requirement is not compatible with said second data flow
9 requirement said data flow director repartitioning a data flow of said first portion
10 to be compatible with said second data flow requirement.

1 35. (Once Amended) A method for parallelizing an operation, the method comprising the
2 steps of:
3 dividing the operation into a set of work partitions;
4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions;
7 said plurality of entities operating in parallel on work partitions assigned to them to
8 perform said operation;
9 generating an execution plan to execute database management system (DBMS) operations
10 in parallel, said execution plan including first and second operations;
11 wherein the step of dividing said operation is performed by dividing said second
12 operation;
13 initiating an operation coordinator in a computer system to coordinate execution of said
14 execution plan;
15 initiating, by said operation coordinator, a first set of slaves operating on a plurality of
16 data partitions to produce data, the quantity of said data partitions being greater
17 than the quantity of said first set of slave processes;
18 initiating, as said plurality of entities, by said operation coordinator, a second set of slaves
19 to consume data; and
20 directing said second set of slaves to produce data and said first set of slaves to consume
21 data when said first set of slaves finishes producing data.

1 36. (Once Amended) The method of claim 35 wherein said execution plan is comprised of
2 operator nodes and said operator nodes are linked together to form execution sets.

1 37. (Once Amended) A method for parallelizing an operation, the method comprising the
2 steps of:
3 dividing the operation into a set of work partitions;

4 assigning work partitions from said set of work partitions to a plurality of entities,
5 wherein at least one entity of said plurality of entities is assigned a plurality of
6 work partitions from said set of work partitions;
7 said plurality of entities operating in parallel on work partitions assigned to them to
8 perform said operation;
9 generating an execution plan to execute said operations in parallel, said execution plan
10 including first and second operations;
11 wherein the step of dividing said operation includes dividing said first operation;
12 initiating producer slaves operating on a plurality of data partitions to produce a first data
13 production;
14 initiating consumer slaves to consume said first data production;
15 when said first data production is completed, generating an identification of a plurality of
16 said consumer slaves that did not receive data in said first data production;
17 examining said identification during a subsequent data production; and
18 reducing said subsequent data production such that said subsequent data production does
19 not produce data for said plurality of said consumer slaves.

1 38. (Once Amended) A method for processing a query, the method comprising the steps of:
2 receiving a statement that specifies at least an operation;
3 determining a user-specified degree of parallelism to use in performing the operation;
4 dividing the operation into a set of work partitions;
5 performing a determination of how many entities to use to perform said operation based,
6 at least in part, on the user-specified degree of parallelism;
7 assigning work partitions from said set of work partitions to a plurality of entities based
8 on said determination; and
9 said plurality of entities operating in parallel on work partitions assigned to them to
10 perform said operation.

1 39. (Once Amended) The method of Claim 38 wherein:
2 the query requires a plurality of operations;

3 the user-specified degree of parallelism is specified in said statement, and
4 the statement specifies said degree of parallelism for a subset of the plurality of
5 operations required by the query.

1 40. (Once Amended) The method of Claim 39 wherein
2 the user-specified degree of parallelism is specified in said statement; and
3 the degree of parallelism specified by the query indicates that no amount of parallelism is
4 to be used during execution of a particular portion of the query.

1 41. (Once Amended) The method of Claim 38 wherein
2 the user-specified degree of parallelism is specified in said statement, and
3 the degree of parallelism specified by the query indicates a maximum amount of
4 parallelism to use during execution of said operation.

1 42. (Once Amended) A method of processing a query, the method comprising the steps of:
2 dividing an operation required by said query into a set of work partitions by generating a
3 set of query fragments;
4 incorporating hints into at least some of said query fragments, wherein the hint associated
5 with a given query fragment indicates how to perform the work partition
6 associated with said given query fragment;
7 assigning query fragments from said set of query fragments to a plurality of entities; and
8 said plurality of entities operating in parallel on query fragments assigned to them to
9 perform said operation, wherein entities working on a query fragment associated
10 with a hint perform the work partition associated with said query fragment in a
11 manner dictated by said hint.

1 43. (Once Amended) The method of Claim 42 wherein the step of incorporating hints
2 includes incorporating hints that dictate the operation of a table scan.

1 44. (Once Amended) The method of Claim 43 wherein the step of incorporating hints that
2 dictate the operation of a table scan includes incorporating hints that rowid partitioning is
3 to be used during the table scan.

1 45. (Once Amended) The method of Claim 42 wherein the step of incorporating hints
2 includes incorporating hints that specify performance of a full table scan.

1 46. (Once Amended) The method of Claim 42 wherein the step of incorporating hints
2 includes incorporating hints that specify using a particular type of join.

1 47. (Once Amended) The method of Claim 46 wherein the step of incorporating hints that
2 specify using a particular type of join includes incorporating hints that specify using a
3 sort/merge join.

1 48. (Once Amended) The method of Claim 46 wherein the step of incorporating hints that
2 specify using a particular type of join includes incorporating hints that specify using a
3 nested loop join.

1 49. (Once Amended) A method of processing a query, the method comprising the steps of:
2 determining a hierarchy of operations associated with a query;
3 dividing a first operation required by said query into a first set of work partitions;
4 dividing a second operation required by said query into a second set of work partitions,
5 wherein said second operation immediately follows said first operation in said
6 hierarchy;
7 dividing a third operation required by said query into a third set of work partitions,
8 wherein said third operation immediately follows said second operation in said
9 hierarchy;
10 assigning work partitions from said first set of work partitions to a first plurality of
11 entities;

12 said first plurality of entities operating in parallel on work partitions assigned to them
13 from said first set of work partitions to perform said first operation;
14 assigning work partitions from said second set of work partitions to a second plurality of
15 entities, wherein said second plurality of entities are different entities than said
16 first plurality of entities; and
17 said second plurality of entities operating in parallel on work partitions assigned to them
18 from said second set of work partitions to perform said second operation;
19 assigning work partitions from said third set of work partitions to said first plurality of
20 entities; and
21 said first plurality of entities operating in parallel on work partitions assigned to them
22 from said third set of work partitions to perform said third operation.

1 50. (Once Amended) The method of Claim 49 further comprising performing the following
2 steps when a given entity in said first set of entities finishes performing a work partition
3 from said first set of work partitions:
4 determining whether there are any unassigned work partitions from said first set of work
5 partitions; and
6 if there are no unassigned work partitions from said first set of work partitions, then
7 assigning the given entity a work partition selected from said third set of work
8 partitions; and
9 if there are unassigned work partitions from said first set of work partitions, then
10 assigning the given entity a work partition selected from said first set of work
11 partitions.

1 51. (Once Amended) The method of Claim 49 wherein the hierarchy includes odd levels and
2 even levels, and the method further comprises the steps of assigning work partitions from
3 odd levels to said first plurality of entities and work partitions from even levels to said
4 second plurality of entities.

1 52. (Once Amended) The method of Claim 49 wherein performing work partitions in said
2 first set of work partitions causes said first set of entities produce output consumed by
3 said second plurality of entities, and performing work partitions in said third set of work
4 partitions causes said first set of entities to consume output produced by said second
5 plurality of entities.

1 53-62. (Cancelled)

1 63. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;
5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions;
8 wherein the step of assigning work partitions is performed by assigning the work
9 partitions in a sequence based at least in part on sizes associated with the work
10 partitions;
11 said plurality of entities operating in parallel on work partitions assigned to them to
12 perform said operation; and
13 wherein assigning the work partitions in a sequence includes assigning a first previously
14 unassigned work partition to a particular entity of the plurality of entities, and
15 when the particular entity completes processing the first work partition, picking a
16 second previously unassigned work partition based at least in part to the size of
17 the second work partition, and assigning the second unassigned work partition to
18 the particular entity for processing.

1 64. (Twice Amended) The computer-readable storage medium of Claim 63 wherein the step
2 of assigning the work partitions in a sequence is performed by assigning relatively larger
3 work partitions before assigning relatively smaller work partitions.

1 65. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;
5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions, wherein the step of assigning
8 work partitions includes
9 assigning said at least one entity a first work partition from said set of work partitions;
10 and
11 after said at least one entity has completed operating on said first work partition,
12 assigning said at least one entity a second work partition from said set of work
13 partitions;
14 said plurality of entities operating in parallel on work partitions assigned to them to
15 perform said operation;
16 wherein the operation is specified in a query that corresponds to a hierarchy of operations;
17 and
18 the step of assigning said at least one entity a second work partition includes
19 determining whether there are any unassigned work partitions from a first level in
20 the hierarchy to which said first work partition belonged; and
21 if there are no unassigned work partitions from the first level in the hierarchy, then
22 selecting said second work partition from a level in said hierarchy that is
23 two levels above said first level in said hierarchy.

1 66. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;

5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions;
8 said plurality of entities operation in parallel on work partitions assigned to them to
9 perform said operation;
10 wherein the instructions include instructions for performing the step of generating a serial
11 execution plan for operations in a database management system (DBMS) running
12 on a computer system;
13 wherein the instructions include instructions for performing the step of generating a
14 parallelized execution plan for said serial execution plan, said parallelized
15 execution plan including first and second operations;
16 wherein the step of dividing an operation is performed by dividing said second operation;
17 wherein the plurality of entities includes one or more slave processes operating on a
18 plurality of data partitions, the quantity of said data partitions being greater than
19 the quantity of said slave processes;
20 wherein the instructions include instructions for performing the step of executing said
21 parallelized execution plan when a plurality of parallel resources of said computer
22 system are available; and
23 wherein the instructions include instructions for performing the step of executing said
24 serial execution plan when said plurality of resources are not available.

1 67. (Twice Amended) The computer-readable storage medium of claim 66 wherein said step
2 of generating a parallelized execution plan includes the steps of:
3 identifying one or more segments of said serial execution plan that can be parallelized;
4 and
5 identifying partitioning requirements of said one or more segments.

1 68. (Twice Amended) The computer-readable storage medium of claim 66 wherein said step
2 of generating a parallelized execution plan is based on a specification of parallelism in a
3 statement specifying one of said operations.

1 69. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;
5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions;
8 said plurality of entities operating in parallel on work partitions assigned to them to
9 perform some operation;
10 generating an execution plan for said operation;
11 examining said execution plan from bottom up;
12 identifying a parallelized portion of said execution plan, said parallelized portion can be
13 processed in parallel, said parallelized portion including first and second
14 operations, said first and second operations being executable in parallel;
15 wherein the step of dividing the operation is performed by dividing said second operation;
16 wherein the plurality of entities includes one or more slave processes operating on a
17 plurality of data partitions, the quantity of said data partitions being greater than
18 the quantity of said slave processes;
19 identifying some serial portion of said execution plan, said serial portion can be processed
20 in serial; and
21 allocating a central scheduler between said parallelized portion and said serial portion.

1 70. (Twice Amended) The computer-readable storage medium of Claim 69 further including
2 instructions for performing the steps of:
3 identifying a first data flow requirement for a first portion of said execution plan said first
4 data flow requirement corresponding to a partitioning of a data flow required by
5 said first portion;
6 identifying a second data flow requirement for a second portion of said execution plan
7 said second data flow requirement corresponding by said second portion; and

8 allocating a data flow director between said first portion and said second portion when
9 said first data flow requirement is not compatible with said second data flow
10 requirement said data flow director repartitioning a data flow of said first portion
11 to be compatible with said second data flow requirement.

1 71. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;
5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions;
8 said plurality of entities operating in parallel on work partitions assigned to them to
9 perform said operation;
10 generating an execution plan to execute database management system (DBMS) operations
11 in parallel, said execution plan including first and second operations;
12 wherein the step of dividing said operation is performed by dividing said second
13 operation;
14 initiating an operation coordinator in a computer system to coordinate execution of said
15 execution plan;
16 initiating, by said operation coordinator, a first set of slaves operating on a plurality of
17 data partitions to produce data, the quantity of said data partitions being greater
18 than the quantity of said first set of slave processes;
19 initiating, as said plurality of entities, by said operation coordinator, a second set of slaves
20 to consume data; and
21 directing said second set of slaves to produce data and said first set of slaves to consume
22 data when said first set of slaves finishes producing data.

1 72. (Twice Amended) The computer-readable storage medium of claim 71 wherein said
2 execution plan is comprised of operator nodes and said operator nodes are linked together
3 to form execution sets.

1 73. (Twice Amended) A computer-readable storage medium carrying instructions for
2 parallelizing an operation, the instructions including instructions for performing the steps
3 of:
4 dividing the operation into a set of work partitions;
5 assigning work partitions from said set of work partitions to a plurality of entities,
6 wherein at least one entity of said plurality of entities is assigned a plurality of
7 work partitions from said set of work partitions;
8 said plurality of entities operating in parallel on work partitions assigned to them to
9 perform said operation;
10 generating an execution plan to execute said operations in parallel, said execution plan
11 including first and second operations;
12 wherein the step of dividing said operation includes dividing said first operation;
13 initiating producer slaves operating on a plurality of data partitions to produce a first data
14 production;
15 initiating consumer slaves to consume said first data production;
16 when said first data production is completed, generating an identification of a plurality of
17 said consumer slaves that did not receive data in said first data production;
18 examining said identification during a subsequent data production; and
19 reducing said subsequent data production such that said subsequent data production does
20 not produce data for said plurality of said consumer slaves.

1 74. (Twice Amended) A computer-readable storage medium storing instructions for
2 processing a query, the instructions including instructions for performing the steps of:
3 receiving a statement that specifies at least an operation;
4 determining a user-specified degree of parallelism to use in performing the operation;
5 dividing the operation into a set of work partitions;

6 performing a determination of how many entities to use to perform said operation based,
7 at least in part, on the user-specified degree of parallelism;
8 assigning work partitions from said set of work partitions to a plurality of entities based
9 on said determination; and
10 said plurality of entities operating in parallel on work partitions assigned to them to
11 perform said operation.

1 75. (Twice Amended) The computer-readable storage medium of Claim 74 wherein:
2 the query requires a plurality of operations;
3 the user-specified degree of parallelism is specified in said statement, and
4 the statement specifies said degree of parallelism for a subset of the plurality of
5 operations required by the query.

1 76. (Twice Amended) The computer-readable storage medium of Claim 75 wherein
2 the user-specified degree of parallelism is specified in said statement; and
3 the degree of parallelism specified by the query indicates that no amount of parallelism is
4 to be used during execution of a particular portion of the query.

1 77. (Twice Amended) The computer-readable storage medium of Claim 74 wherein
2 the user-specified degree of parallelism is specified in said statement, and
3 the degree of parallelism specified by the query indicates a maximum amount of
4 parallelism to use during execution of said operation.

1 78. (Twice Amended) A computer-readable storage medium carrying instructions for
2 processing a query, the instructions including instructions for performing the steps of:
3 dividing an operation required by said query into a set of work partitions by generating a
4 set of query fragments;
5 incorporating hints into at least some of said query fragments, wherein the hint associated
6 with a given query fragment indicates how to perform the work partition
7 associated with said given query fragment;

8 assigning query fragments from said set of query fragments to a plurality of entities; and
9 said plurality of entities operating in parallel on query fragments assigned to them to
10 perform said operation, wherein entities working on a query fragment associated
11 with a hint perform the work partition associated with said query fragment in a
12 manner dictated by said hint.

1 79. (Twice Amended) The computer-readable storage medium of Claim 78 wherein the step
2 of incorporating hints includes incorporating hints that dictate the operation of a table
3 scan.

1 80. (Twice Amended) The computer-readable storage medium of Claim 79 wherein the step
2 of incorporating hints that dictate the operation of a table scan includes incorporating
3 hints that rowid partitioning is to be used during the table scan.

1 81. (Twice Amended) The computer-readable storage medium of Claim 78 wherein the step
2 of incorporating hints includes incorporating hints that specify performance of a full table
3 scan.

1 82. (Twice Amended) The computer-readable storage medium of Claim 78 wherein the step
2 of incorporating hints includes incorporating hints that specify using a particular type of
3 join.

1 83. (Twice Amended) The computer-readable storage medium of Claim 82 wherein the step
2 of incorporating hints that specify using a particular type of join includes incorporating
3 hints that specify using a sort/merge join.

1 84. (Twice Amended) The computer-readable storage medium of Claim 82 wherein the step
2 of incorporating hints that specify using a particular type of join includes incorporating
3 hints that specify using a nested loop join.

1 85. (Twice Amended) A computer-readable storage medium carrying instructions for
2 processing a query, the instructions including instructions for performing the steps of:
3 determining a hierarchy of operations associated with a query;
4 dividing a first operation required by said query into a first set of work partitions;
5 dividing a second operation required by said query into a second set of work partitions,
6 wherein said second operation immediately follows said first operation in said
7 hierarchy;
8 dividing a third operation required by said query into a third set of work partitions,
9 wherein said third operation immediately follows said second operation in said
10 hierarchy;
11 assigning work partitions from said first set of work partitions to a first plurality of
12 entities;
13 said first plurality of entities operating in parallel on work partitions assigned to them
14 from said first set of work partitions to perform said first operation;
15 assigning work partitions from said second set of work partitions to a second plurality of
16 entities, wherein said second plurality of entities are different entities than said
17 first plurality of entities; and
18 said second plurality of entities operating in parallel on work partitions assigned to them
19 from said second set of work partitions to perform said second operation;
20 assigning work partitions from said third set of work partitions to said first plurality of
21 entities; and
22 said first plurality of entities operating in parallel on work partitions assigned to them
23 from said third set of work partitions to perform said third operation.

1 86. (Twice Amended) The computer-readable storage medium of Claim 85 further
2 comprising instructions for performing the following steps when a given entity in said
3 first set of entities finishes performing a work partition from said first set of work
4 partitions:
5 determining whether there are any unassigned work partitions from said first set of work
6 partitions; and

7 if there are no unassigned work partitions from said first set of work partitions, then
8 assigning the given entity a work partition selected from said third set of work
9 partitions; and
10 if there are unassigned work partitions from said first set of work partitions, then
11 assigning the given entity a work partition selected from said first set of work
12 partitions.

1 87. (Twice Amended) The computer-readable storage medium of Claim 85 wherein the hierarchy includes odd levels and even levels, and the instructions further include instructions for performing the steps of assigning work partitions from odd levels to said first plurality of entities and work partitions from even levels to said second plurality of entities.

1 88. (Twice Amended) The computer-readable storage medium of Claim 85 wherein performing work partitions in said first set of work partitions causes said first set of entities produce output consumed by said second plurality of entities, and performing work partitions in said third set of work partitions causes said first set of entities to consume output produced by said second plurality of entities.

1 89-91. (Canceled).

1 92. (Once Amended) The method of Claim 38, wherein the user-specified degree of parallelism is specified in said statement.

1 93. (Once Amended) The method of Claim 38, wherein the user-specified degree of parallelism is specified for operations that involve a particular table.

1 94. (Twice Amended) The computer-readable storage medium of Claim 74, wherein the user-specified degree of parallelism is specified in said statement.

1 95. (Twice Amended) The computer-readable storage medium of Claim 74, wherein the user-
2 specified degree of parallelism is specified for operations that involve a particular table.
3